

REMARKS

Claims 1-6 and 13-18 are pending in the Application. Claims 13-18 are allowed. Claims 4-6 are objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1-3 are rejected under 35 U.S.C. §103(a). Applicants respectfully traverse these rejections for at least the reasons stated further below and respectfully request that the Examiner reconsider and withdraw these rejections.

Applicants note that the Specification has been amended as indicated above to replace the phrase "ARC" with "anti-reflective coating" to prevent any potential trademark infringement as well as to correct typographical mistakes.

Applicants further note that claims 1, 2, 3, 6 and 18 have been amended to replace the phrase "ARC" with "anti-reflective coating" to prevent any potential trademark infringement and not to overcome prior art. Hence, no prosecution history estoppel arises from the amendments to claims 1, 2, 3, 6 and 18. *Festo Corp v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 62 U.S.P.Q.2d 1705, 1711-1712 (2002); 56 U.S.P.Q.2d 1865, 1870 (Fed. Cir. 2000). Further, the amendments made to claims 1, 2, 3, 6 and 18 were not made for a substantial reason related to patentability and therefore no prosecution history estoppel arises from such amendments. *See Festo Corp.*, 62 U.S.P.Q.2d 1705 at 1707 (2002); *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 41 U.S.P.Q.2d 1865, 1873 (1997).

I. REJECTIONS UNDER 35 U.S.C. §103(a):

The Examiner has rejected claims 1-3 as being unpatentable over Chung et al. (U.S. Patent No. 6,184,142) (hereinafter "Chung") in view of Applicants' Background. Applicants respectfully traverse these rejections for at least the reasons stated below and respectfully request that the Examiner reconsider and withdraw these rejections.

A. The Examiner has not provided any objective evidence or source of motivation for modifying Chung with Applicants' Background.

A *prima facie* showing of obviousness requires the Examiner to establish, *inter alia*, that the prior art references teach or suggest, either alone or in combination, all of the limitations of the claimed invention, and the Examiner must provide a motivation or suggestion to combine or modify the prior art reference to make the claimed inventions. M.P.E.P. §2142. The showings must be clear and particular and supported by objective evidence. *In re Lee*, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433-34 (Fed. Cir. 2002); *In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000); *In re Dembiczak*, 50 U.S.P.Q.2d. 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not evidence. *Id.*

The Examiner's motivation for modifying Chung with Applicants' Background to pattern a resist layer where the resist layer includes a pattern having a plurality of apertures therein for etching a portion of a layer desired to be etched, as recited in claim 1 is "since by this manner it would provide a ground for the subsequent processing steps in forming plural gate stacks." Paper No. 12, page 3. The Examiner's motivation is insufficient to support a *prima facie* case of obviousness for at least the reasons stated below.

The motivation to modify Chung with Applicants' Background must come from one of three possible sources: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. *In*

re Rouffet, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998). The Examiner has not provided any evidence that his motivation comes from any of these sources. Instead, the Examiner is relying upon his own subjective opinion which is insufficient to support a *prima facie* case of obviousness. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002). Consequently, the Examiner's motivation is insufficient to support a *prima facie* case of obviousness for rejecting claims 1-3.

Furthermore, the Examiner's conclusion of obviousness is based on improper hindsight reasoning. The Examiner's motivation "since by this manner it would provide a ground for the subsequent processing steps in forming plural gate stacks" appears to have been gleaned from Applicants' disclosure. In fact, the Examiner points out that Applicants' Background teaches a resist layer with a plurality of apertures in order to form a plurality of gates stacks. Any judgment on obviousness must not include knowledge gleaned from Applicants' disclosure. *In re McLaughlin*, 170 U.S.P.Q. 209, 212 (C.C.P.A. 1971). Consequently, the Examiner's motivation is insufficient to support a *prima facie* case of obviousness for rejecting claims 1-3. M.P.E.P. §2145.

Furthermore, the Examiner has not provided any objective evidence as to why one of ordinary skill in the art would modify Chung to pattern a resist layer to have a plurality of apertures therein in order to form a plurality of gate stacks. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002). Chung specifically teaches forming a single via which requires a single aperture and not a plurality of apertures in the photoresist. Column 2, lines 49-57; Figures 6A-F. Instead, the Examiner merely relies upon his own subjective opinion which is insufficient to establish a *prima facie* case of obviousness. *Id.* Consequently, the Examiner has not presented a *prima facie* case of obviousness in rejecting claims 1-3. *Id.*

As a result of the foregoing, Applicants respectfully assert that the Examiner has not presented a *prima facie* case of obviousness in rejecting claims 1-3. M.P.E.P. §2143.

B. Chung and Applicants' Background, taken singly or in combination, do not teach or suggest the following limitations.

Applicants respectfully assert that Chung and Applicants' Background, taken singly or in combination, do not teach or suggest "removing the resist layer utilizing a plasma etch, the anti-reflective coating layer begin resistant to the plasma etch" as recited in claim 1. The Examiner cites to column 1, lines 52-67 of Chung as teaching or suggesting the above-cited claim limitation. Paper No. 11, page 4. Applicants respectfully traverse the assertion that Chung teaches or suggests the above-cited claim limitation.

Chung instead teaches that a type of low k organic silicon-oxide film with lower carbon-content showed better resistance to pure O₂ plasma during photoresist strip steps. Column 1, lines 57-60. However, the Examiner had previously cited cap layer 114 of Chung as teaching an anti-reflective coating layer. Paper No. 13, page 2. Chung further teaches that stop layer 114 is an etch barrier film such as silicon nitride to prevent the upper trench patterns of dual damascene from being etched through. Column 4, lines 24-26. Chung further teaches that other barrier layers may be used such as silicon oxynitride as long as it has different etch characteristics than low k organic dielectric film and can be used as ARC layer. Column 4, lines 28-31. Chung further teaches that stop layer 114 allows a selective etch process with respect to different underlying materials and also eliminates reflection of incident light. Column 4, lines 31-33. Hence, Chung teaches that stop layer 114 is to have different etch characteristics than low k organic dielectric films. Chung further teaches that the low k organic dielectric films, such as layers 113 and 112 beneath stop layer 114, may have some resistance to pure O₂ plasma. However, Chung does not teach or suggest that stop layer 114 is resistant to a plasma etch. Therefore, the Examiner has not presented a *prima facie* case of obviousness, since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Claims 2-3 each recite combinations of features including the above combinations, and thus are patentable for at least the above-stated reasons. Claims 2-3 recite additional features, which, in combination with the features of claim 1 upon which they depend, are patentable over Chung in view of Applicants' Background.

For example, Chung and Applicants' Background, taken singly or in combination, do not teach or suggest "performing the plasma etch using a plasma including a forming gas, the anti-reflective coating layer being resistant to the plasma etch using the plasma including the forming gas" as recited in claim 3. The Examiner cites to column 1, lines 52-67 of Chung as teaching or suggesting an anti-reflective coating layer being resistant to a plasma etch using the plasma including the forming gas. Paper No. 11, page 4. Applicants respectfully traverse the assertion that Chung teaches or suggests the above-cited claim limitation.

As stated above, Chung instead teaches that a type of low k organic silicon-oxide film with lower carbon-content showed better resistance to pure O₂ plasma during photoresist strip steps. Column 1, lines 57-60. However, the Examiner had previously cited cap layer 114 of Chung as teaching an anti-reflective coating layer. Paper No. 13, page 2. Chung further teaches that stop layer 114 is an etch barrier film such as silicon nitride to prevent the upper trench patterns of dual damascene from being etched through. Column 4, lines 24-26. Chung further teaches that other barrier layers may be used such as silicon oxynitride as long as it has different etch characteristics than low k organic dielectric film and can be used as ARC layer. Column 4, lines 28-31. Chung further teaches that stop layer 114 allows a selective etch process with respect to different underlying materials and also eliminates reflection of incident light. Column 4, lines 31-33. Hence, Chung teaches that stop layer 114 is to have different etch characteristics than low k organic dielectric films. Chung further teaches that the low k organic dielectric films, such as layers 113 and 112 beneath stop layer 114, may have some resistance to pure O₂ plasma. However, Chung does not teach or suggest that stop layer 114 is resistant to a plasma etch.

Neither does Chung teach or suggest that stop layer 114 is resistant to plasma including a forming gas. Therefore, the Examiner has not presented a *prima facie* case of obviousness, since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

II. ALLOWABLE SUBJECT MATTER:

Applicants thank the Examiner for the allowance of claims 13-18. Applicants further thank the Examiner for the indication of allowability of claims 4-6.

III. CONCLUSION

As a result of the foregoing, it is asserted by Applicants that claims 1-6 and 13-18 in the Application are in condition for allowance, and Applicants respectfully request an allowance of such claims. Applicants respectfully request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining issues.

Respectfully submitted,

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